

Amendments to the Claims

This listing of claim will replace all prior versions and listings of claim in the application.

1. (currently amended) A position sense interface for a micro-mechanical element, comprising:
a substrate;
at least one proof mass;
at least a first and a second electrically decoupled sense capacitors, each of said first and second capacitors comprising at least a first independent terminal on said proof mass and a second independent terminal on said substrate; and
position detection circuitry comprising a differential charge integrator with input-sensed, output driven feedback.
2. (original) The position sense interface of claim 1 wherein said integrator includes an operational amplifier having an input and an output, and an input sensing, output driving feedback circuit.
3. (original) The position sense interface of claim 1 wherein said position detection circuitry operates over a first non-overlapping time period and a second non-overlapping time period.
4. (original) The position sense interface of claim 2 wherein the feedback is common mode.
5. (original) The position sense interface of claim 2 wherein the differential charge integrator senses common mode.
6. (original) The position sense interface of claim 2 wherein the feedback is time multiplexed.
7. (original) The position sense interface of claim 2 wherein the feedback is frequency multiplexed.
8. (original) The position sense interface of claim 2 wherein the feedback is continuous-time.

9. (cancelled)

10. (cancelled)

11. (original) The position sense interface of claim 1 further including a compensating charge on each said sense capacitor.

12. (cancelled)

13. (original) The position sense interface of claim 1 further including a first and a second reference capacitor.

14. (original) The position sense interface of claim 13 wherein said first and said second reference capacitor are substantially equal.

15. (original) The position sense interface of claim 13 further including at least one binary weighted capacitor array in parallel with at least one reference capacitor.

16. (original) The position sense interface of claim 13 wherein a charge is applied to said position detection circuitry by a changing voltage applied to said reference capacitors.

17. (original) The interface of claim 1, wherein at least one of said sense capacitors is formed as part of a micromechanical structure formed in or on said substrate; and

said position detection circuitry is formed in and on said substrate, and includes an operational amplifier and a negative feedback circuit.

18. (original) The interface of claim 17 wherein said negative feedback circuit is an input-sensing, output driving feedback circuit.

19. (original) The interface of claim 17 wherein said micromechanical structure includes a first proof

mass and a second proof mass.

20. (original) The interface of claim 19 wherein said first proof mass comprises said first sense capacitor and said second proof mass comprises said second sense capacitor.

21. (original) The interface of claim 20 wherein said first and second sense capacitors are coupled in said feedback circuit.

22. (original) The interface of claim 20 wherein said first proof mass and said second proof mass are connected so as to electrically decouple said sense capacitors.

23. *(cancelled)*

24. (original) The interface of claim 17 wherein said operational amplifier includes at least a first input, and a first signal applied to said feedback circuit places said operational amplifier in unity gain feedback during a first non-overlapping time period.

25. (original) The interface of claim 17 wherein a second signal to said feedback circuit places said operational amplifier in a charge integration mode during a second non-overlapping time period.
